



E-LEARNING NOTEBOOK

Subject : Biology
Level : Secondary 1
Time Allocation : 90 minutes
Date Issued : Tuesday, 28 April 2020

LESSON PREVIEW

Lesson topic : Major Organ System

Objective :

1. Students are able to describe the diversity of organ system based on observation results.
2. Students are able to correlate between one organ systems to other as the element of the body

PRIOR KNOWLEDGE:

Living things are also called organisms. They are given this name because most living things have bodies composed of organs. An organ is a part of the body that performs a special task to help the organism live. The task an organ performs is related to one of the seven life processes. Some organs form a group to carry out a task to keep living things alive. These groups of organs are called organ systems.

Based on the description above, answer the following questions:

- (1) Name four structures in your body that passes the air through the lungs.
- (2) Locate the position of these following organs in the human body:
 - a. The adrenal gland
 - b. The bladder
 - c. The liver
- (3) What could you do to check your heart beat?

KNOWLEDGE

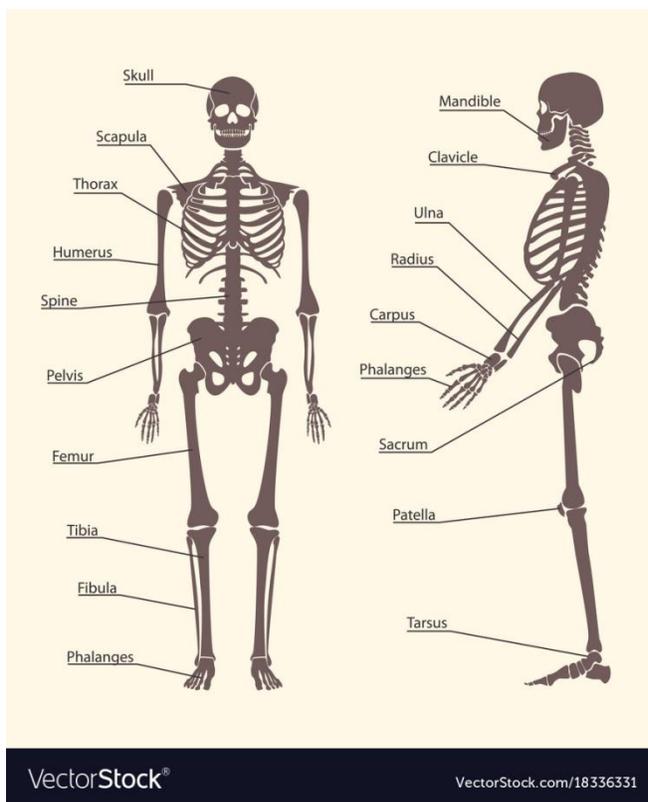
Organ System of a human

In animals, there are groups of organ that work together to carry out a task to keep the animal alive. These groups are called organ systems and each system performs tasks related to one of life processes.

Musculoskeletal System

(1) Skeletal

There are 206 bones in the human skeleton. Each arm and hand together have 30 bones. Each leg and foot together have 29 bones. The skeleton accounts for 15% of the mass of the body. The tissue of the skeleton is hardened as it takes calcium from the digested food.



The brain and the spinal cord form the central nervous system and are made from soft tissue. They could be easily damaged without a hard covering. The bones of the skull are fused together to make a strong case around the brain. The backbone is made of 33 bones known as vertebrae. There is a hole in each vertebra through which the spinal cord runs. The column of vertebrae makes a tube of bone around the spinal cord. There are gaps between the vertebrae through which nerves pass from the spinal cord to the body. The ribs and backbone form a protective structure around the lungs and heart.

The organs that form systems such as the digestive, circulatory, excretory and respiratory systems account for 20% of the body's weight. The organs are made from soft material and have no strong supporting material inside them. The bones of the skeleton provide a strong structure to which the organs are attached. They allow the organs to be spread out in the body without squashing into each other. The muscles account for 45% of the body's weight. They are also made from soft tissue but gain their support from the bones to which they are attached.

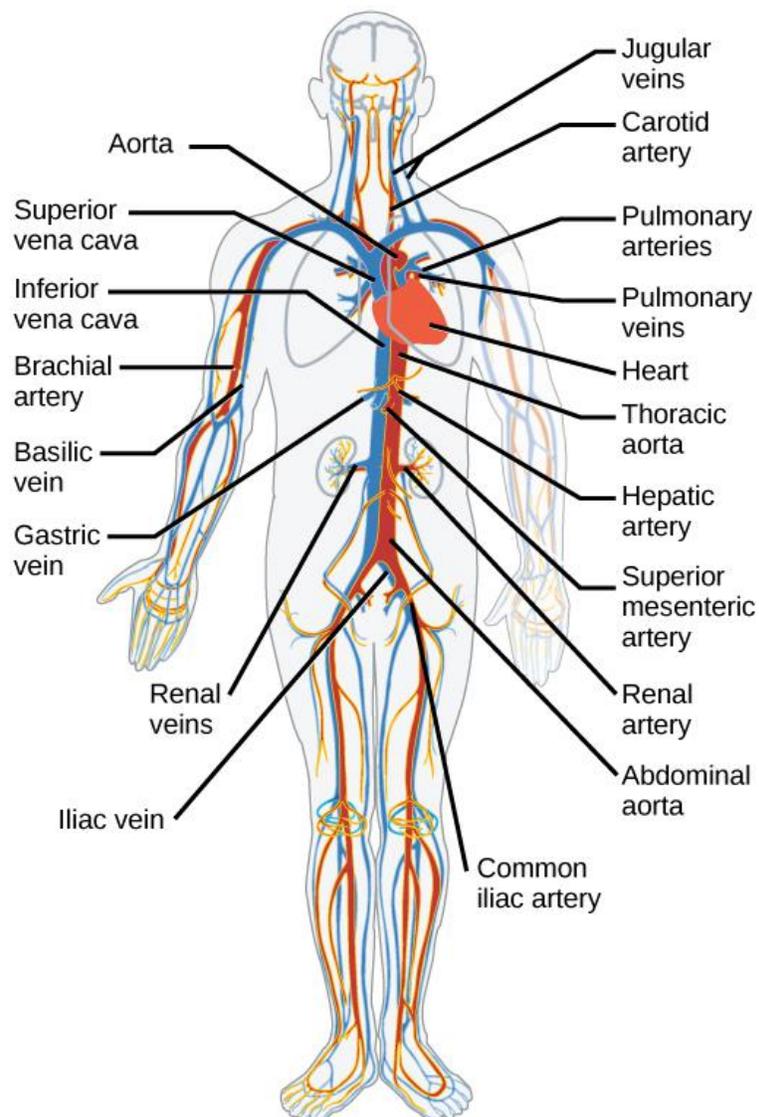
The place where bones meet is called a joint. In some joints, such as those in the skull, the bones are fused together and cannot move. Most joints, however allow some movement. Some joints such as the elbow or knee are called hinge joint because the movement is like the hinge or door. The bones can only move forwards or backwards. A few joints such as the hip are called ball-and-socket joint because the end of the bone forms a round structure like a ball that fits into a cup-shaped socket. These joints allow much more movement.

(2) Muscles

Muscle is made up from tissue that has the power to move. It can contract to become shorter. A muscle is attached to two bones across a joint. When muscle gets shorter, it exerts a pulling force. This moves one of the bones but the other stays stationary. For example, the biceps muscle in the upper arm is attached to the shoulder blade and to the radius bone in the forearm. When the biceps shortens or contracts, it exerts a pulling force on the radius and raises the forearm.

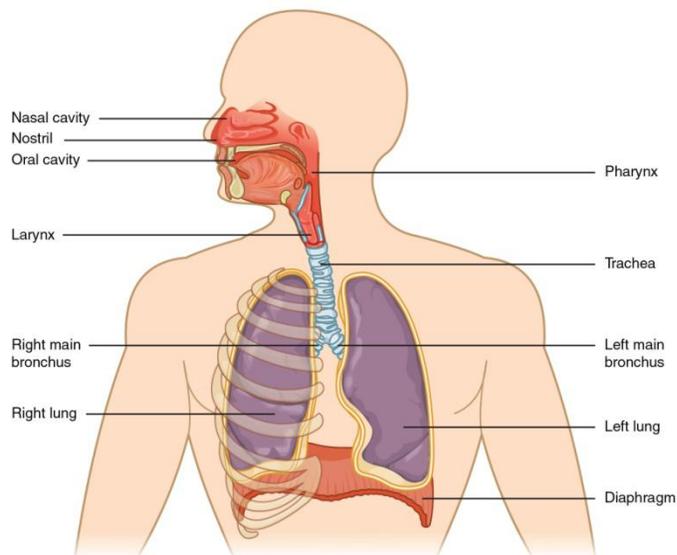
Circulatory System

The heart is located near the centre of the chest. It is made of muscle called cardiac muscle which makes the heart beat. As the heart beats it pushes blood into the arteries and draws blood in from the veins. The beating of the heart makes the blood circulate around the body. The heart and blood vessels make up the circulatory system. The beating of the heart can be checked by taking the pulse.



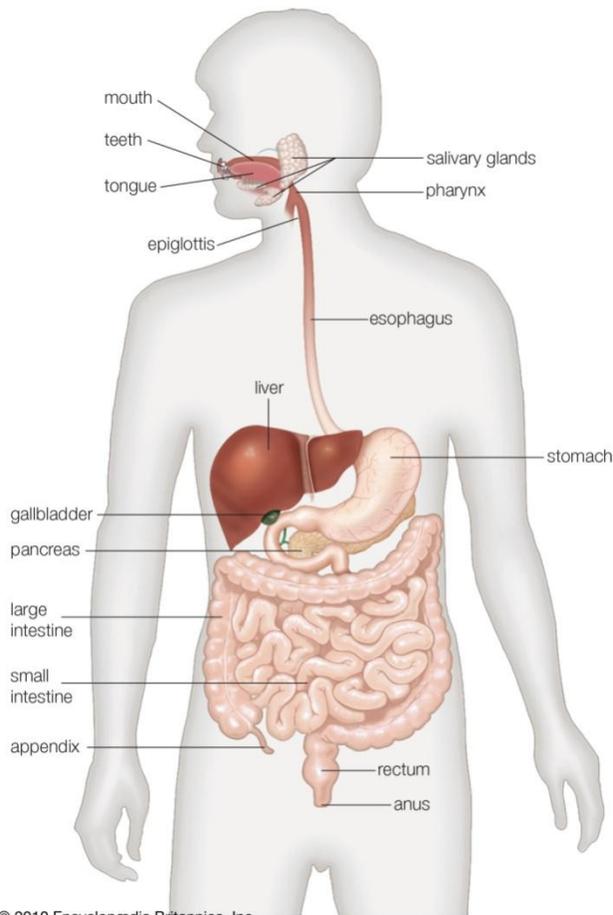
Respiratory System

The respiratory system consists of several organs, such as the nose, trachea, bronchi and lungs. Air enters through the nose, passes down the back of the mouth and into the voice box and windpipe. You can feel your voice box and windpipe by placing your fingers on the front of your neck. They are hard because they are made of cartilage or gristle. This material helps to keep the airways open at all times. The bottom of the windpipe divides into two tubes called bronchi. The bronchi carry the air into lungs. Here some oxygen passes through the walls of the lungs into the blood. Carbon dioxide passes from the blood through the walls of the lungs into the air.



Digestive System

The main part of the digestive system is a tube that runs through the body. It is called the alimentary canal, and includes the esophagus, stomach and intestines. In an adult it is about 8-9 m long. If you wind out a thread from a ball of wool until 9 m long, you will get an idea of the length of the alimentary canal. If you fold up the thread you will see that it can fit into a small space. The folding of the alimentary canal allows it to fit in the lower part of the body called the abdomen.

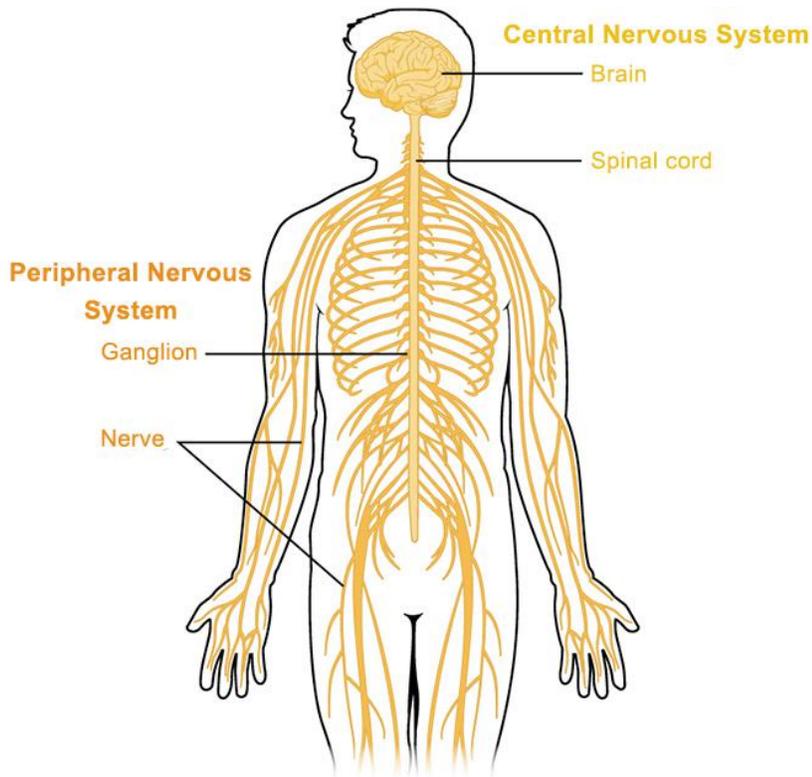


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It takes between 24 and 48 hours for the food to travel along the alimentary canal, but journey times can vary quite widely. For example, a meal of boiled rice only stays in the stomach for up to two hours, while roast chicken may stay for up to seven hours. Food begins its journey in the mouth, where it is broken up by the teeth and moistened by the saliva so that the small pieces can slide easily along. In the stomach, the food is churned up into a creamy liquid called chyme, before it continues its journey into the intestines.

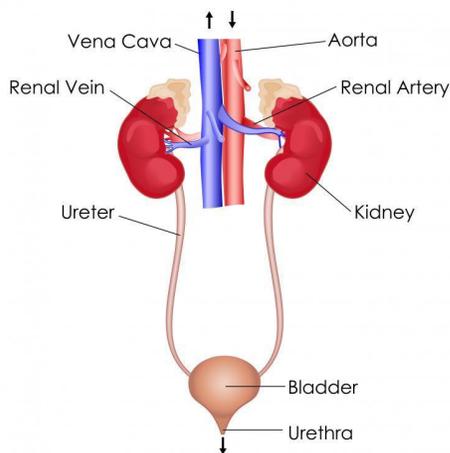
Nervous System

The nervous system comprises the brain, spinal cord and nerves. The brain is enclosed in the skull and the spinal cord is enclosed in the spinal column. Nerves connect the brain to the eyes, ears, tongue, nose and skin on the head. Nerves also connect the spinal cord to the skin and to other organs in the body. Messages travel through the nervous system as tiny electrical signals. The sense organs send signals to the spinal cord and the brain. If the brain decides that the body should move, it sends signals to the muscles.



Excretory System

The wastes produced by the body collect in the blood. They are removed from the body by the excretory system. As the blood passes through the kidneys, a waste called urea is filtered from the blood with some water. This mixture of urea and water is called urine. As the blood passes through the skin on a hot day, water and a little urea are taken from it and released onto the skin. The main purpose of this action is to cool the skin, although a little urea is excreted. As the blood passes through the lungs, carbon dioxide is removed and passed into the air, ready to be breathed out.



Sensory System

The sensory system is made up of the sense organs-the eyes, nose, ears, tongue and skin are the sense organs of sight, hearing, smell, taste and touch respectively. The function of this system is to provide information about the surroundings of an animal. The information is sent in the form of electrical signals or messages along nerves in the nervous system to the brain.

Endocrine System

The endocrine system is made up of glands, which release chemicals called hormones into the blood. The adrenal gland is an example of an endocrine gland. It is found just above the kidney and release a hormone called adrenaline. You may feel the effect of adrenaline if you are asked to read aloud or act in front of a large audience or take part in athletics. It makes your heart beat faster and directs more blood to your muscles. Hormones also control the way people grow and develop. The hormone insulin helps the body store a sugar that has been absorbed from digested food. A lack of this hormone in the body leads to a disease called diabetes. Diabetes can be controlled by taking extra insulin into the body.

EXERCISE

Answer the following questions based on the information above.

- (1) What is the name of the hormone that makes your heart beats faster and directs more blood to your muscles?
- (2) You are walking across a road and hearing a sound behind you. You turn and see that a car which has swerved to avoid a donkey and is heading straight for you. What body systems work to get you out of the car's way? Why do you think these systems developed?
- (3) What are the sense organs in the sensory system?
- (4) What movements take place in the body that you do not have to think about?
- (5) Why do you think that some joints are painful in elderly people?
- (6) When the joint is damaged, how does the tissue heal it?

(7) The skull forms a solid sheet of protection and the ribs form a cage. Why do you think the rib cage is not a solid sheet like the skull? Which offers better protection, the sheet or the cage? Explain your answer.

EXIT SLIP

1. If you were a doctor, which organ system would you want to study for your specialist?
Why would you want to study it?
2. What is the important thing of this topic for you as a student?
3. What is the relation between organ and organ system? Explain clearly.